



### **Note: Onsite and Online Options**

In order to accommodate a large number of situations, we are offering the option for either physical presence or virtual participation. We would be delighted if all authors manage to attend in person, but are aware that special circumstances are best handled by having flexible options.

### **Submission:**

**1. Inform the Chair:** with the Title of your Contribution

**2. Submission URL:**

<https://www.iariasubmit.org/conferences/submit/newcontribution.php?event=COGNITIVE+2020+Special>

Please select Track Preference as **BRAINCOMAG**

### **Special track**

## **BRAINCOMAUG: Brain Computer Interface for Augmenting Human Cognition**

Chair and Coordinator

Dr. Jayfus T. Doswell, The Juxtopia Group, JUICE-Lab, USA

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along with

COGNITIVE 2020, The 12<sup>th</sup> International Conference on Advanced Cognitive Technologies and Applications

<https://www.aria.org/conferences2020/COGNITIVE20.html>

October 25 - 29, 2020 - Nice, France

Brain computer interfaces (BCI) (i.e., also known as Brain Machine Interfaces) have the potential to augment and improve human cognition ranging from implantable neuro-prosthesis; repairing injured or augmenting parts of the brain (i.e., hippocampus to convert short-term memories into long-term memories); facilitating secret non-verbal communication among teams of peers; and restoring active memories to accelerating human learning and skill acquisition with non-invasive neural-engineering and computational brain-to-human neuron mapping. Although advances have been made in BCI for augmenting or improving human cognition, this subset of BCI augmentation/enhancement is new and requires continuous and empirical multidisciplinary research to solve challenges so that it may be applied to the real world. These challenges include, but are not limited to, Low BCI signal strength; Inaccurate signal classification; Machine learning of neuronal communication; Data transfer rate/High error rate; non-linearity, non-stationarity/noise, and high dimensionality; high dimensionality curse; noise removal; linear discriminant analysis; support vector machine; and K nearest neighbors.

### **Topics include, but not limited to:**

- Quantum or DNA computing for analyzing target brain areas.
- Non-invasive wearable BCI for data recording and data extraction.
- Non-invasive wearables for augmenting target brain regions with technologies ranging from transcranial magnetic stimulation to X
- Advanced nanotech or smart materials to amplify neural coverage areas and frequency.
- Frameworks for identifying, interpreting, and enhancing key function(s) of brain areas.



- System for identifying and interpreting various signal types used for decoding brain signals.
- Framework for delivering robust BCI learning algorithms including, but not limited to, artificial intelligent based deep learning.
- Systems for understanding the effect of feedback on robust control of BCI.
- Process and systems for understanding the interaction of invasive and non-invasive electrode and cortical tissue.
- BCI for accurate thought-to-text translation to achieve silent-talk.
- Intelligent brain amplification through wireless BCI IoT connectivity.
- Dynamic Digital Twin mapping to human brain for probability neural intervention analysis.
- Cybersecurity access control
- Novel neuro-prosthesis interactivity to devices ranging from prosthetics to robotics.
- BCI methods for enhancing and quantifiably evaluating human learning.
- BCI interoperability with Big Data for faster cognitive decision support.
- Re-establishing and strengthening synaptic connections and transmission using BCI.

### **Important Datelines**

Inform the Chair: As soon as you decide to contribute

Submission: August 1, 2020

Notification: August 21, 2020

Registration: September 1, 2020

Camera-ready: September 1, 2020

### **Contribution Types**

- Regular papers [in the proceedings, digital library]
- Short papers (work in progress) [in the proceedings, digital library]
- Posters: two pages [in the proceedings, digital library]
- Posters: slide only [slide-deck posted on [www.iaria.org](http://www.iaria.org)]
- Presentations: slide only [slide-deck posted on [www.iaria.org](http://www.iaria.org)]
- Demos: two pages [posted on [www.iaria.org](http://www.iaria.org)]

### **Paper Format**

- See: <http://www.iaria.org/format.html>

- Before submission, please check and comply with the editorial rules: <http://www.iaria.org/editorialrules.html>

### **Publications**

- Extended versions of selected papers will be published in IARIA Journals: <http://www.iariajournals.org>
- Print proceedings will be available via Curran Associates, Inc.: <http://www.proceedings.com/9769.html>
- Articles will be archived in the free access ThinkMind Digital Library: <http://www.thinkmind.org>

### **Paper Submission**

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### **Registration**

- Each accepted paper needs at least one full registration, before the camera-ready manuscript can be included in the proceedings.



- Registration fees are available at <http://www.iaia.org/registration.html>

**Contact**

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